

# WATEROUS

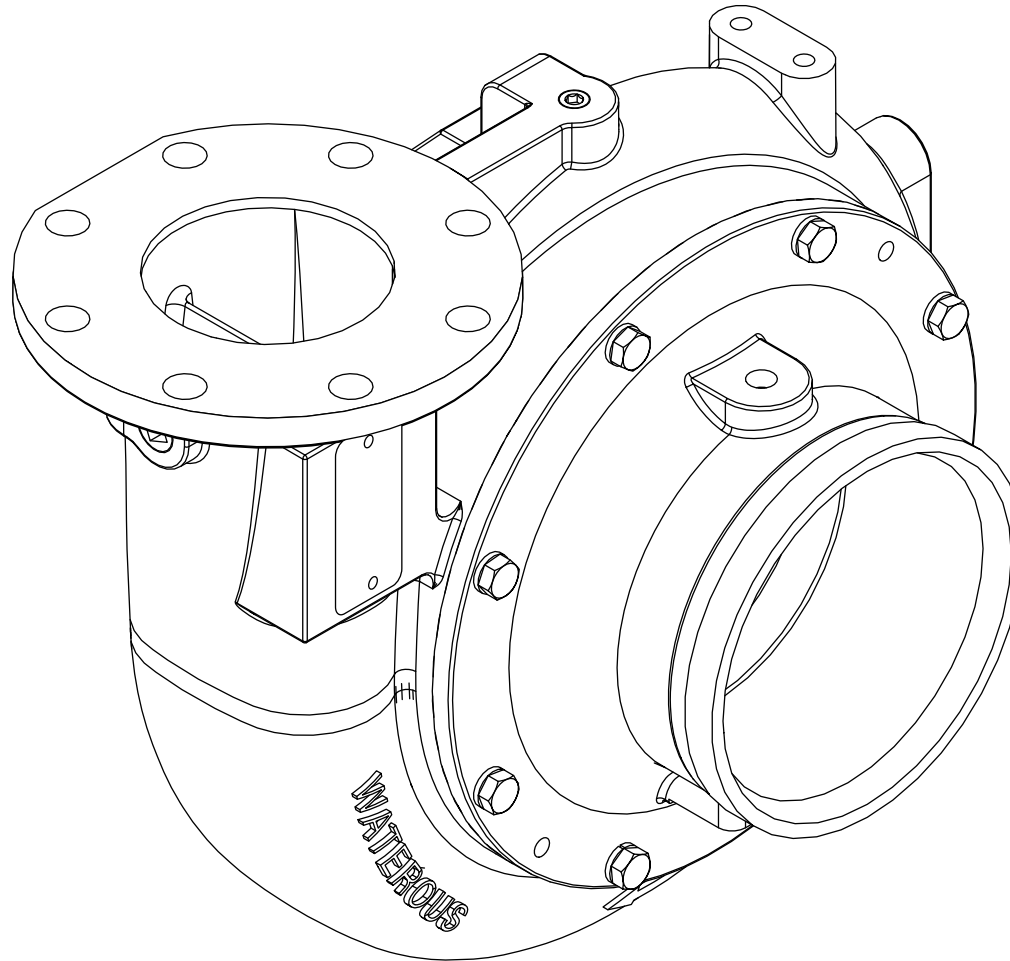
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## CX Series Fire Pump

### Installation

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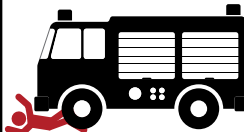
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## Safety Precautions

- Read and understand all the associated documentation before you begin installing the product.
- Contact Waterous when you have questions about installing the equipment.
- Read and understand all the notices and safety precautions.
- Do not operate the equipment when safety guards are removed.
- Do not modify the equipment.

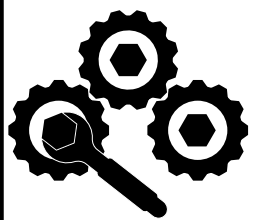
 <b>WARNING</b>	
<p><b>Sudden Unexpected Movement</b></p> <ul style="list-style-type: none"> <li>• Unexpected movement can cause injury or death.</li> <li>• Make sure the shift unit is in the proper mode before operation.</li> </ul>	

 <b>WARNING</b>	
<p><b>Hot Liquid</b></p> <ul style="list-style-type: none"> <li>• Hot liquid can scald you.</li> <li>• Do not operate if water temperature exceeds 160°F (71°C).</li> </ul>	

<b>NOTICE</b>	
<p><b>Before Operation</b></p> <ul style="list-style-type: none"> <li>• Read and understand all the instructions provided.</li> <li>• Check all fluid levels and replenish if necessary.</li> <li>• Remove all shipping plugs and install the operation plugs or caps.</li> </ul>	

 <b>WARNING</b>	
<p><b>Hot Surface</b></p> <ul style="list-style-type: none"> <li>• Hot surfaces can burn you.</li> <li>• Do not touch the surface during operation—allow it to cool after operating.</li> </ul>	

 <b>WARNING</b>	
<p><b>High Pressure</b></p> <ul style="list-style-type: none"> <li>• Discharge ejected at high pressure can cause serious injury and damage.</li> <li>• Direct discharge away from people and equipment.</li> </ul>	

<b>NOTICE</b>	
<p><b>Maintenance</b></p> <ul style="list-style-type: none"> <li>• Not following maintenance procedures can damage your equipment.</li> <li>• Perform all maintenance procedures as required.</li> </ul>	

Use this document to install and operate your Waterous equipment. Understand the following conditions before continuing with the document:

- The instructions may refer to options or equipment that you may not have purchased with your system.
- The illustrations in this document are intended to convey concepts. Do not use the illustrations to determine physical attributes, placement, or proportion.
- Understand that your application may require additional steps, that are not described in the illustrations or instructions, to perform the installation.
- The equipment described in this document is intended to be installed by a person or persons with the necessary skills and knowledge to perform the installation.
- The equipment described in this document is intended to be operated by a person or persons with the basic knowledge of operating similar equipment.
- The information in this document is subject to change without notice.

This document is divided into the following sections:

#### SAFETY

This section describes general precautions and alert symbols that are in this document.

#### INTRODUCTION

This section is an overview of the document.

#### OVERVIEW

This section describes the components that make up the system.

#### INSTALLATION

This section describes installing the equipment.

## Using this Document

Use the guidelines below when viewing this document.

### Viewing the Document Electronically

- View this document in landscape orientation.
- Use the table of contents to navigate directly to that section.
- Text **with this appearance** is linked to a reference.

### Printing the Document

- The document is best viewed when printed on both sides and in color.
- Use a 3-ring binder to store the document.

## Additional Documentation

Additional documentation is available through the MyWaterous login at [Waterousco.com](http://Waterousco.com). Use your serial number to gain access to the service parts list associated with your system. Dimensional drawings are available through the Waterous Service department.

## Symbols

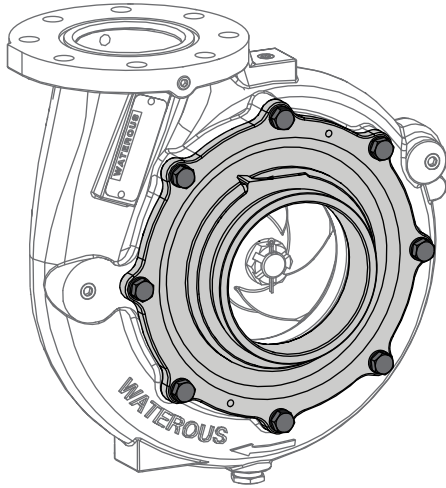
Symbols are used to illustrate additional tools or operations that are required to complete the instruction.



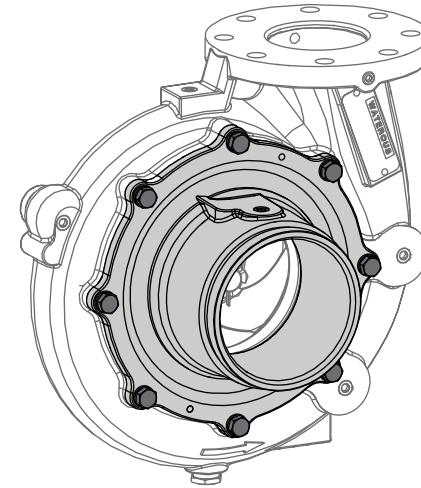
Torque to specification—This symbol tells you to torque the hardware to the specified value.

## CX Series Pump Configurations

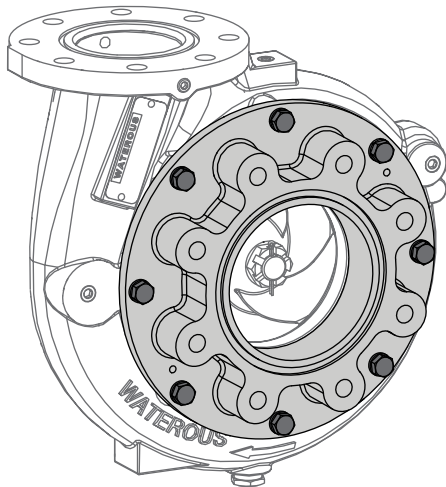
The CX series pump is available in several configurations. Configurations include clockwise or counterclockwise rotation, with or without an inducer, a short, standard, or dual intake adapter.



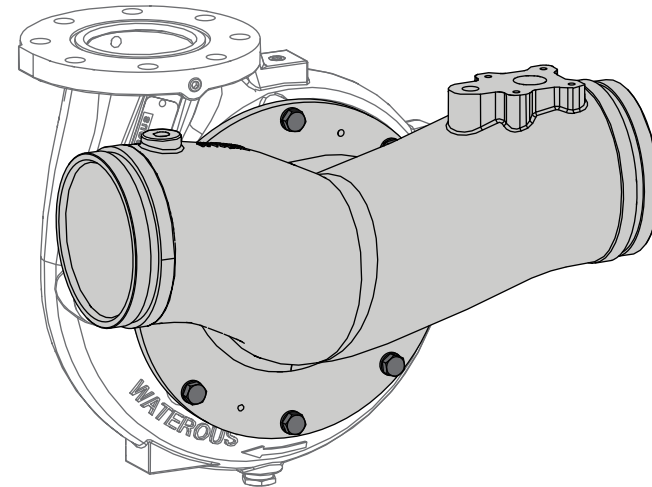
Short Single Victaulic Intake - CXV



Standard (Long) Single Victaulic Intake - CXV



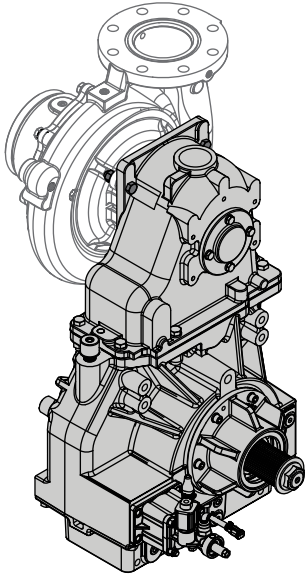
DIN 150 Flanged Intake - CXN



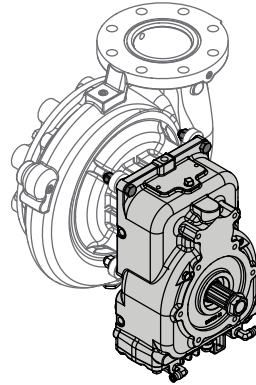
Dual Victaulic Intake - CXS

## CX Series Drive Configurations

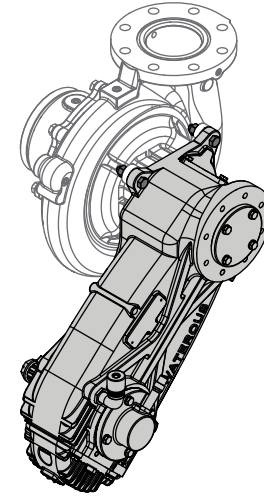
The CX series pump is available with the following drive options.



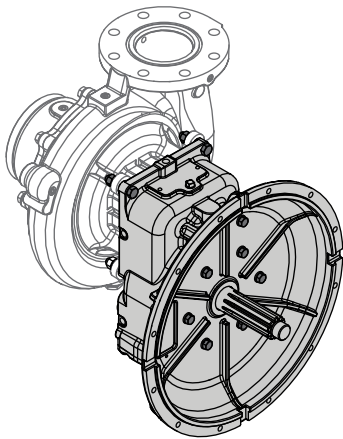
CX with C22 Transmission



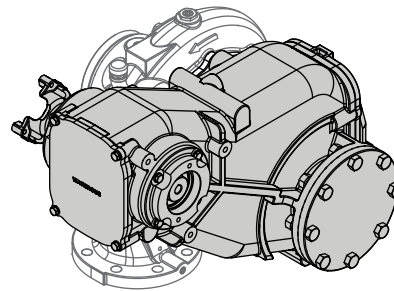
CX with K Transmission



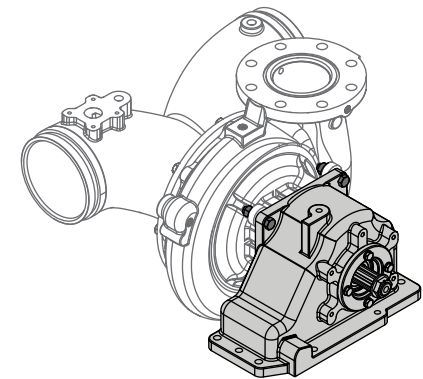
CX with PA Transmission



CX with T Transmission



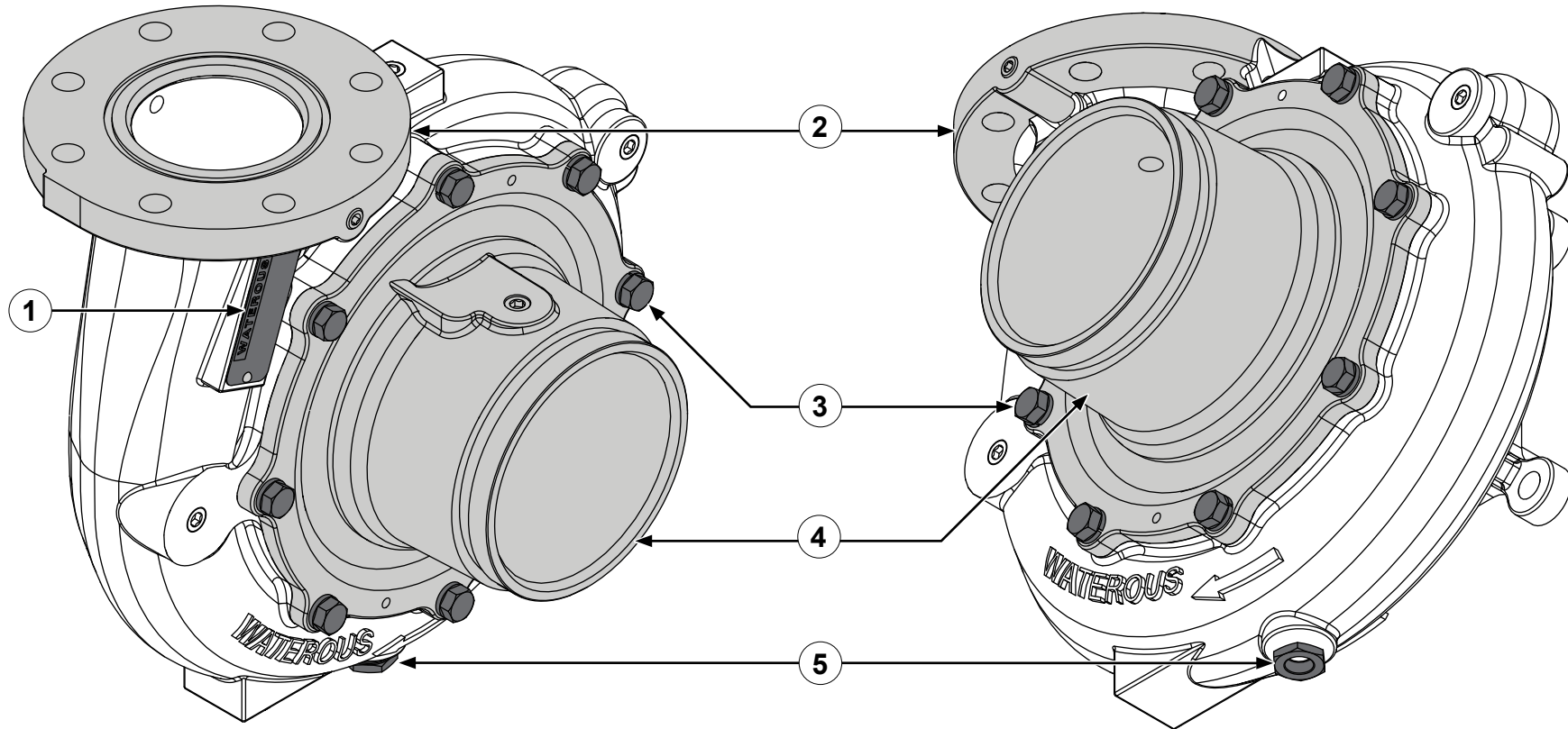
CX with QB Transmission



CX with Direct Drive

## CX Series Pump Overview

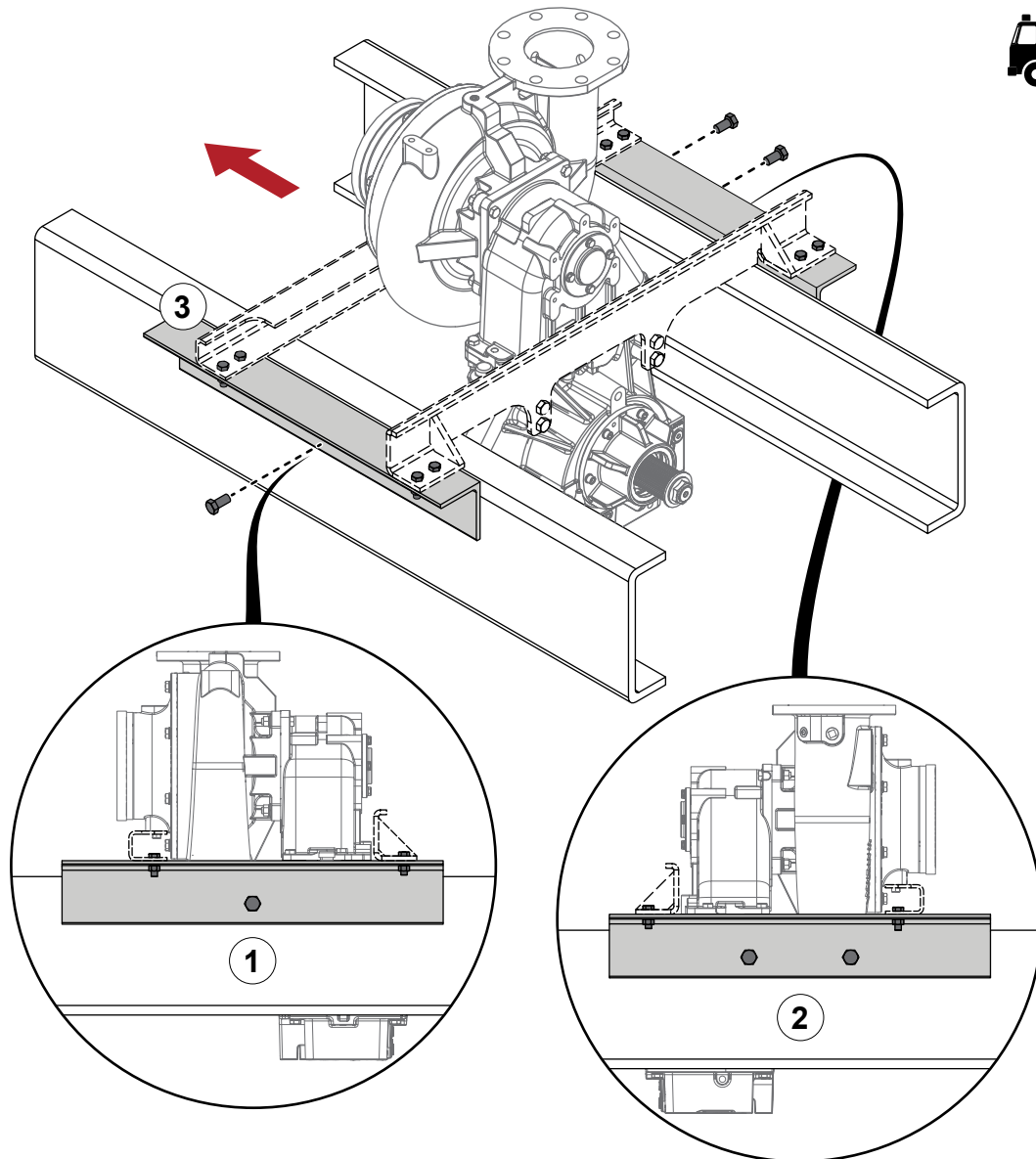
Common CX series applications include the illustrated features.



Feature	Description
1 Serial number plate	This displays the pump serial number.
2 Discharge	Water exits the pump through this discharge.
3 Intake adapter hardware	This secures the mounting adapter to the volute and provides attachment points for apparatus mounting bracketry.
4 Intake adapter	Water enters the pump through this intake—standard adapter shown.
5 Drain port	This port is used to drain the pump. <b>Note:</b> Drain locations are determined by pump orientation.



## Installing the Pump and Transmission—Three-Point Mounting Method



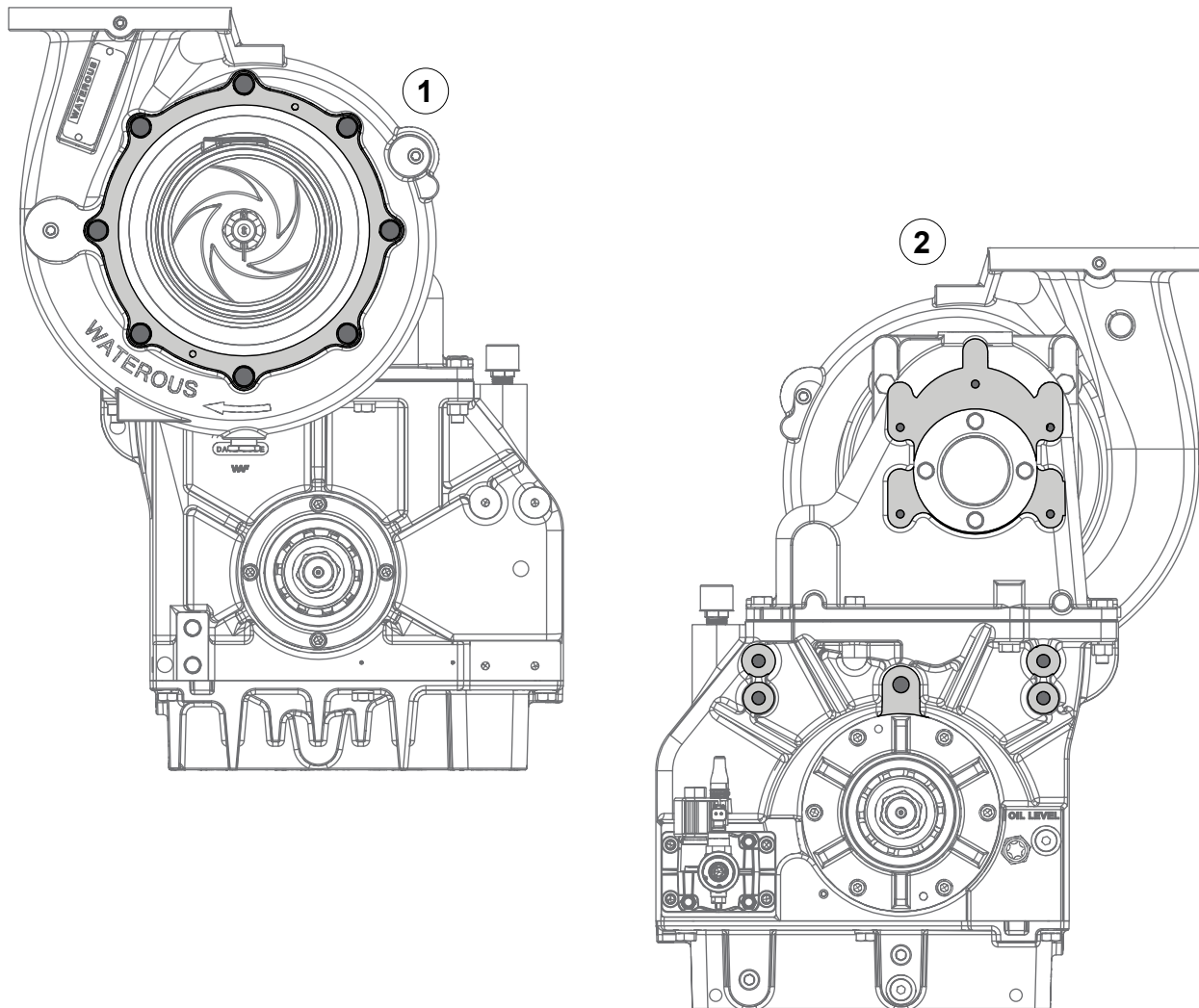
Use the illustration and instructions to create a mounting system that allows you to mount the pump assembly between the apparatus frame rails using the three-point mounting method.

A three-point mounting system allows the frame to flex around the equipment, whereas a rigid mounting could damage the equipment and void the warranty. It is the responsibility of the purchaser to effectively mount the equipment to the apparatus so that it cannot damage the equipment.

Follow the orientation indicated by the illustration to properly locate and install the mounting system specific to your application.

- 1 Create an angle bracket to mount to the frame. Drill one hole into the center of the angle bracket that goes through the frame rail. Use the appropriate hardware to secure the angle bracket to the frame rail while allowing it to pivot.
- 2 Create an angle bracket to mount to the frame. Drill two holes into the angle bracket that go through the frame rail. Position one hole near each edge of the angle bracket. Use the appropriate hardware to secure the bracket to the frame rail.
- 3 Create custom brackets vto support the pump assembly. Secure the custom brackets to the angle brackets that you installed on the frame rails.

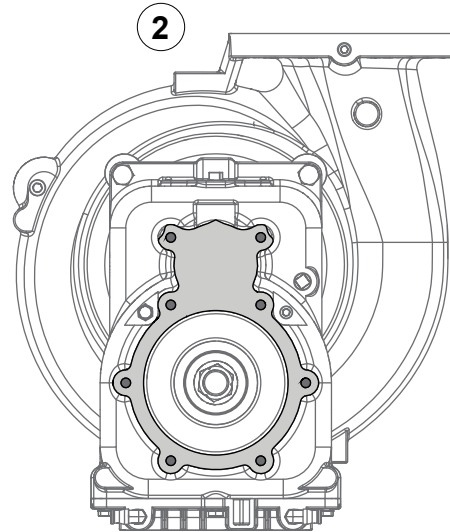
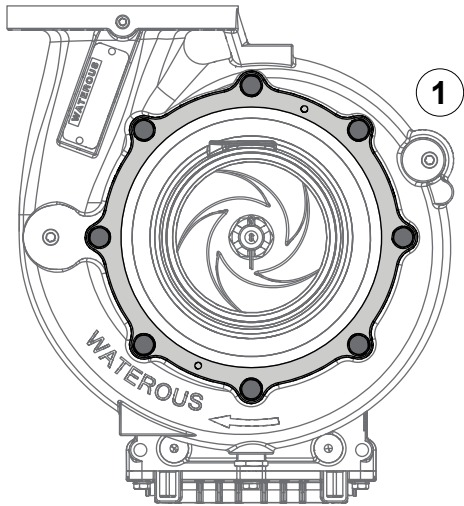
## Mounting Points CXC22



Use the illustrations and instructions to locate the mounting holes to use with corresponding bracketry that mounts the equipment to the apparatus.

- 1 Replace the appropriate adapter hardware that allows you to secure the pump to the mounting bracketry.
- 2 Use the available mounting locations on the transmission to secure the transmission to the mounting bracketry.

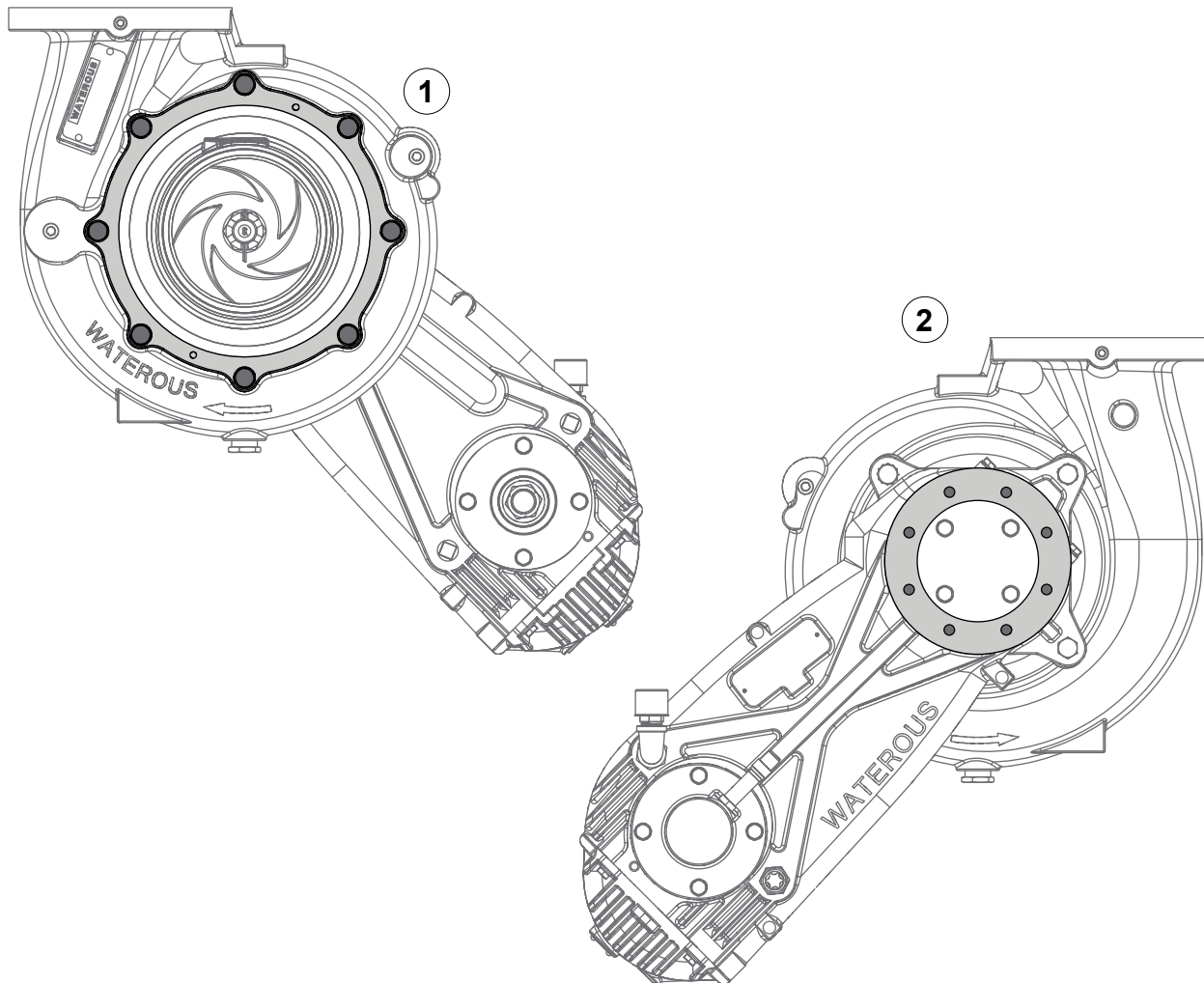
## Installing the Pump—CXK



Use the illustrations and instructions to locate the mounting holes to use with corresponding bracketry that mounts the equipment to the apparatus.

- 1 Replace the appropriate adapter hardware that allows you to secure the pump to the mounting bracketry.
- 2 Use the available mounting locations on the transmission to secure the transmission to the mounting bracketry.

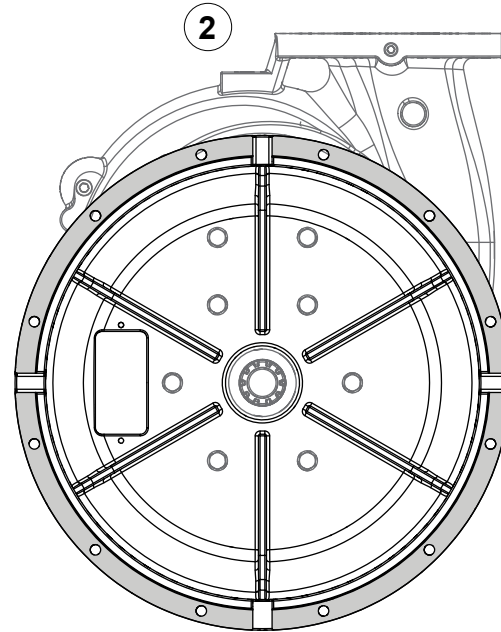
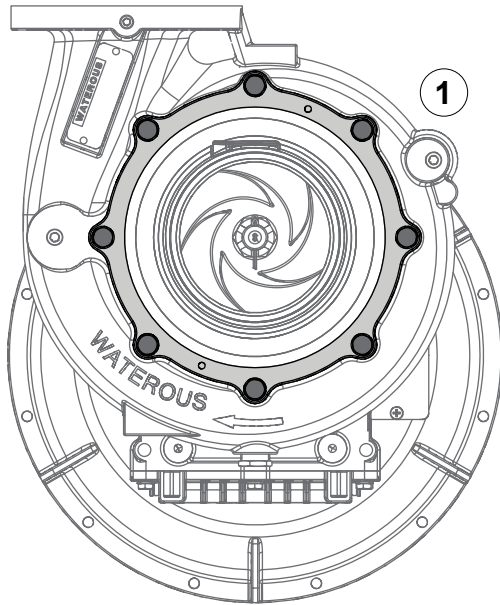
## Installing the Pump—CXPA



Use the illustrations and instructions to locate the mounting holes to use with corresponding bracketry that mounts the equipment to the apparatus.

- 1 Replace the appropriate adapter hardware that allows you to secure the pump to the mounting bracketry.
- 2 Use the available mounting locations on the transmission to secure the transmission to the mounting bracketry.

## Installing the Pump—CXT

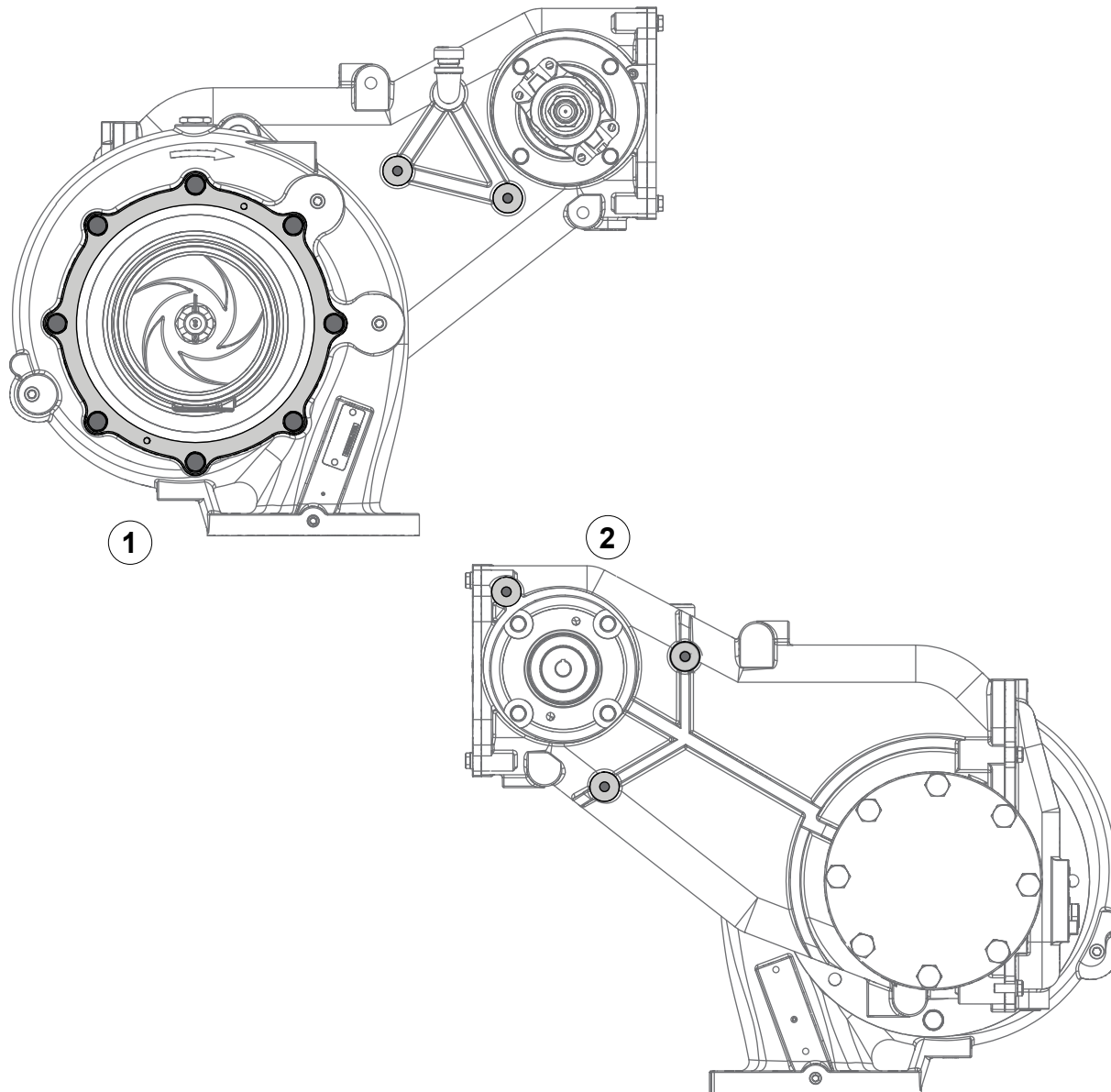


Use the illustrations and instructions to locate the mounting holes to use with corresponding bracketry that mounts the equipment to the apparatus.

- 1 Replace the appropriate adapter hardware that allows you to secure the pump to the mounting bracketry.
- 2 Use the available mounting locations on the transmission to secure the transmission to the mounting bracketry.

**Note:** Source and install pilot bearing on the input shaft. Refer to the pump dimensional drawing for details specific to your pump

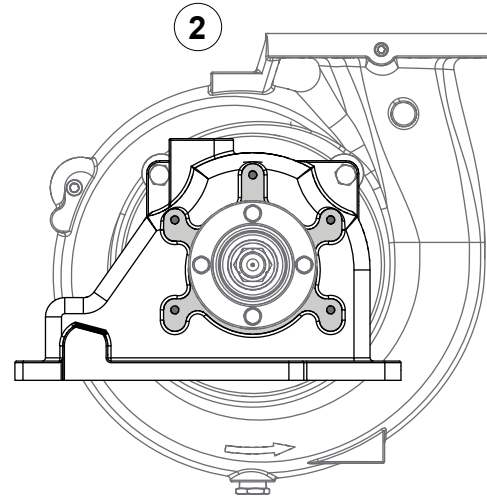
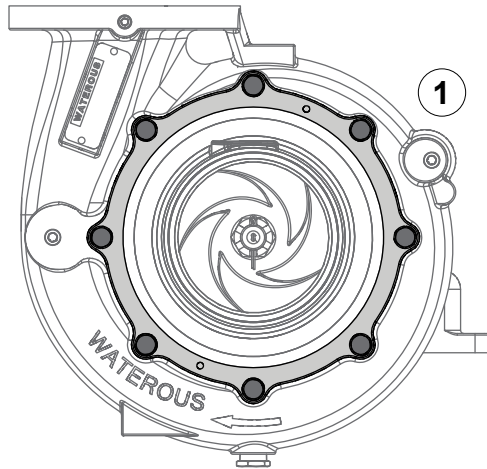
## Installing the Pump—CXQB



Use the illustrations and instructions to locate the mounting holes to use with corresponding bracketry that mounts the equipment to the apparatus.

- 1 Replace the appropriate adapter hardware that allows you to secure the pump to the mounting bracketry.
- 2 Use the available mounting locations on the transmission to secure the transmission to the mounting bracketry.

## Installing the Pump—CXD



Use the illustrations and instructions to locate the mounting holes to use with corresponding bracketry that mounts the equipment to the apparatus.

- 1 Replace the appropriate adapter hardware that allows you to secure the pump to the mounting bracketry.
- 2 Use the available mounting locations on the transmission to secure the transmission to the mounting bracketry.

## Lubrication

Transmissions are shipped without lubricant and must be filled before operation. The table below shows the recommended lubricant for each transmission. Understand that lubricant capacities vary based on gear ratio, transmission orientation, or both. Make sure that the apparatus is on a flat surface before assessing the oil level. Always fill to the bottom of the oil level plug or site plug.

Transmission Model	Lubricant
C22	Automatic transmission fluid (ATF) that meets the requirements of DEXRON III or MERCON.
K and T	Gear lube spec—75W-90 full synthetic.
PA	ATF that meets the requirements of DEXRON III or MERCON.
QB	ATF that meets the requirements of DEXRON III or MERCON.
D (Direct Drive)	No lubrication required.

## Transmission Temperature Specifications

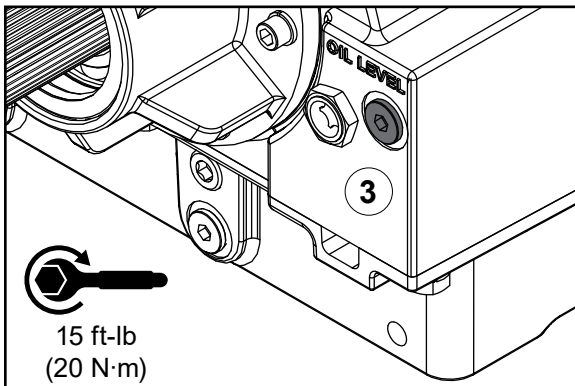
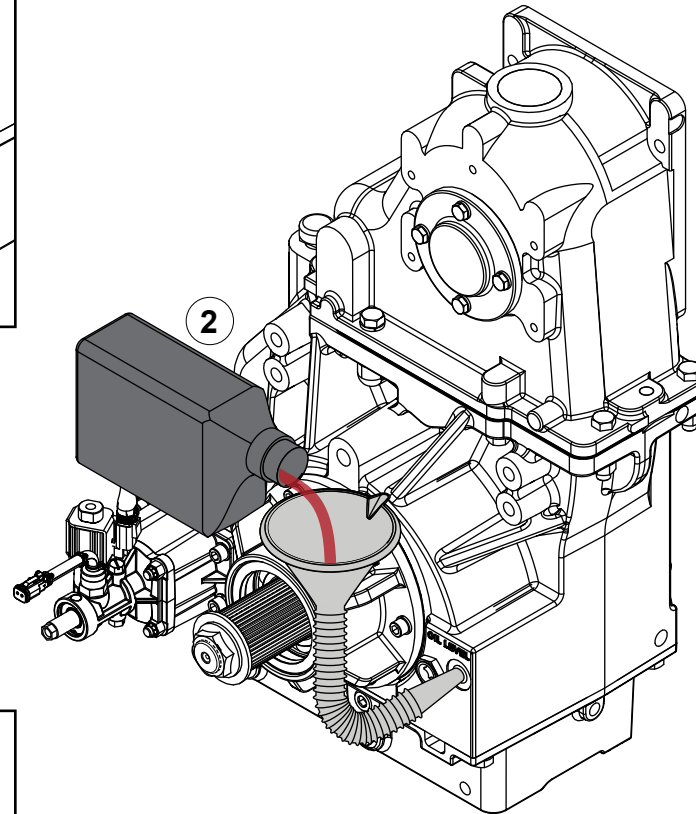
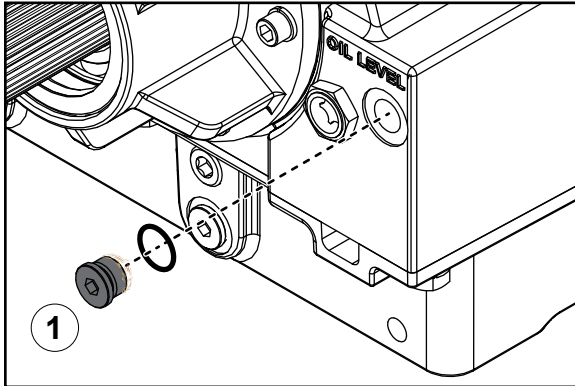
For all transmissions, including the direct-drive bearing housing, the maximum acceptable temperature at external surfaces is 250°F (121°C).

## Testing After Installation

Perform standard tests associated with the operation of centrifugal pumps, along with any tests outlined in the transmission instructions or required by the National Fire Protection Association (NFPA). During the tests, listen for unusual noises, check for leaks, and monitor the smoothness of operation.



## Adding Lubrication—C22 Transmission



Use the illustration and instructions to add transmission fluid. Use ATF that meets the requirements of DEXRON III or MERCON V.

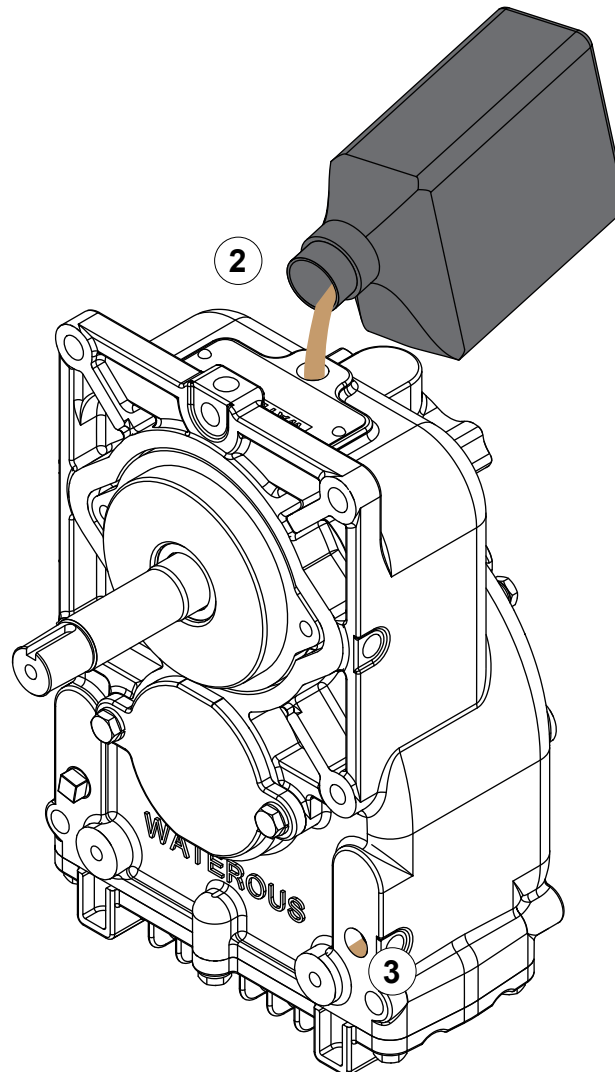
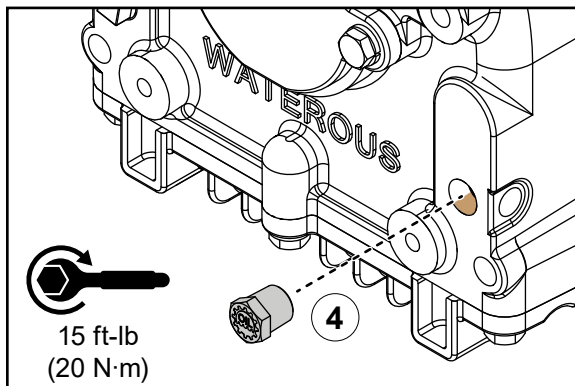
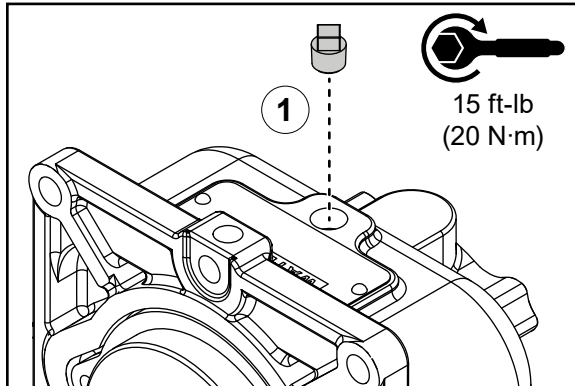
1 Remove the magnetic plug. Remove any metal fragments that collected on the magnetic plug. Inspect the O-ring for deterioration and replace it if necessary.

2 Add transmission fluid until it is at the midpoint of the sight plug.

**Note:** Know that it will take several minutes for fluid to circulate within the transmission. Allow time for fluid to flow into the internal chambers of the transmission.

3 Install the magnetic plug and torque to 15 ft-lb (20 N·m).

## Adding Lubrication—K Transmission



Use the illustrations and instructions to add lubrication to the transmission. Use gear lube, 75W-90 full synthetic.

- 1 Remove the oil fill plug.

**Note:** The plug location is determined by the transmission orientation.

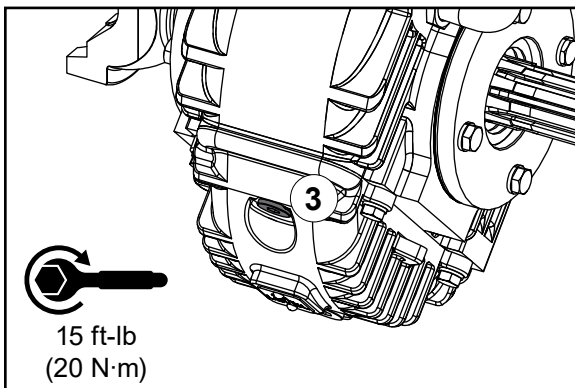
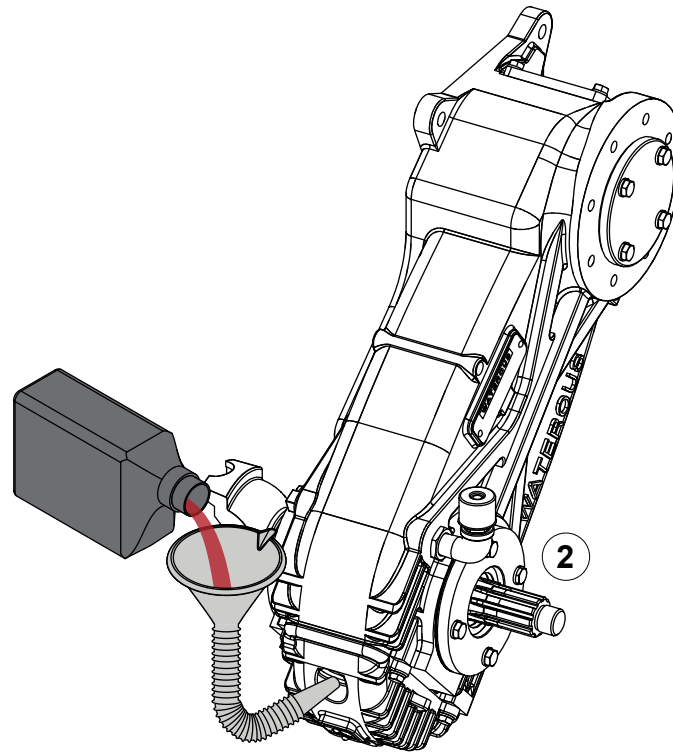
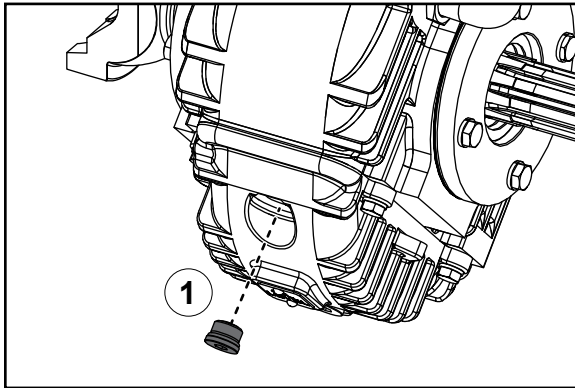
- 2 Add fluid to the transmission case.

**Note:** After pouring some fluid into the case, allow it to settle before adding more to avoid over-filling.

- 3 Add fluid to until it reaches the oil level plug.

- 4 Install the oil level plug and the oil fill plug.

## Adding Lubrication—PA Transmission



Use the illustration and instructions to add transmission fluid. Use ATF that meets the requirements of DEXRON III or MERCON V.

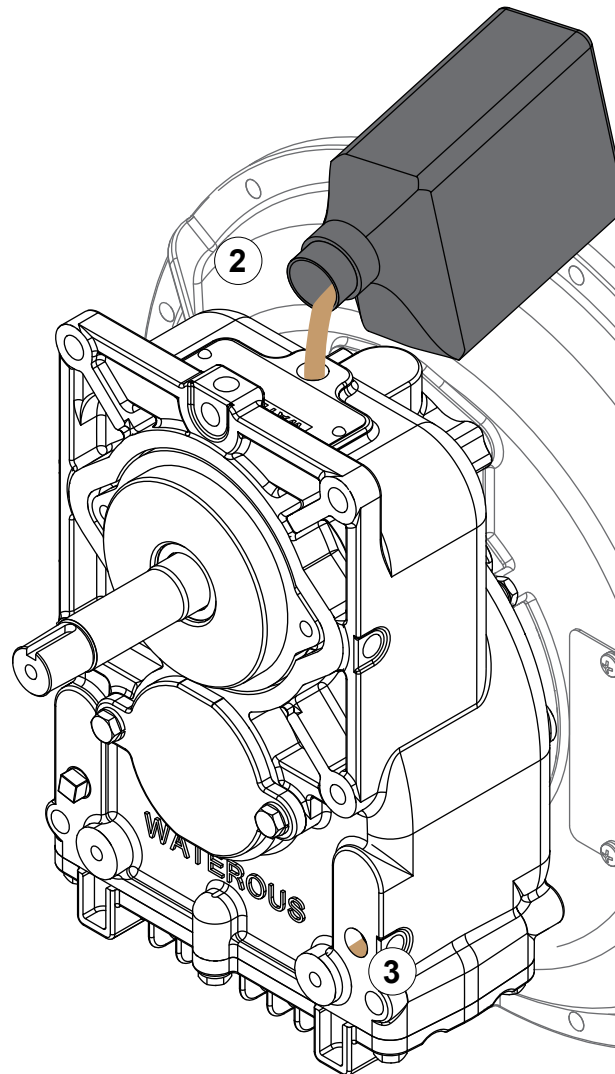
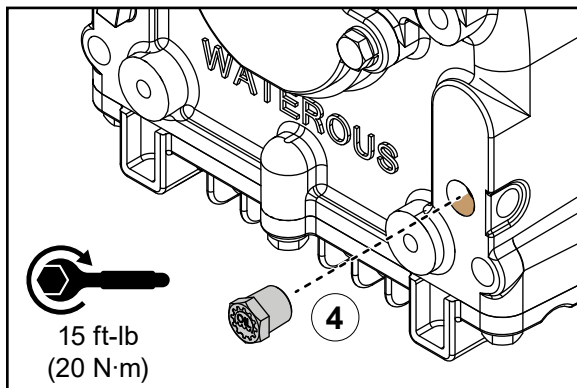
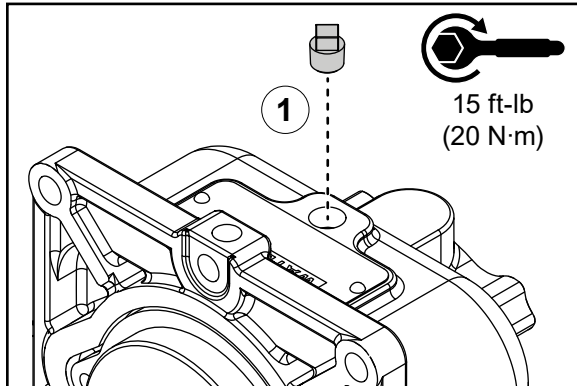
- 1 Remove the oil fill plug.
- 2 Add lubricant until it reaches halfway up the oil level sight plug.

**Note:** After pouring some fluid into the case, allow it to settle before adding more to avoid over-filling.

- 3 Securely install the oil fill plug.

**Note:** Make sure that you do not over-tighten the oil fill plug.

## Adding Lubrication—T Transmission



Use the illustrations and instructions to add lubrication to the transmission. Use gear lube, 75W-90 full synthetic.

- 1 Remove the oil fill plug.

**Note:** The plug location is determined by the transmission orientation.

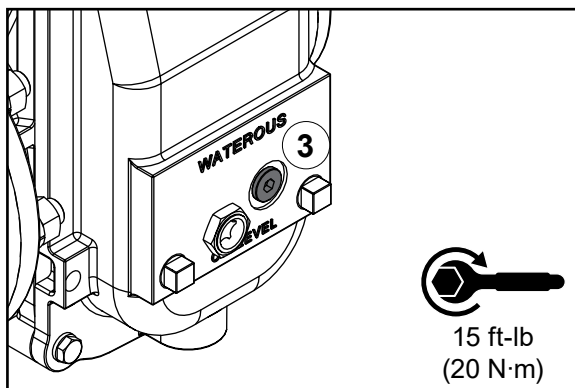
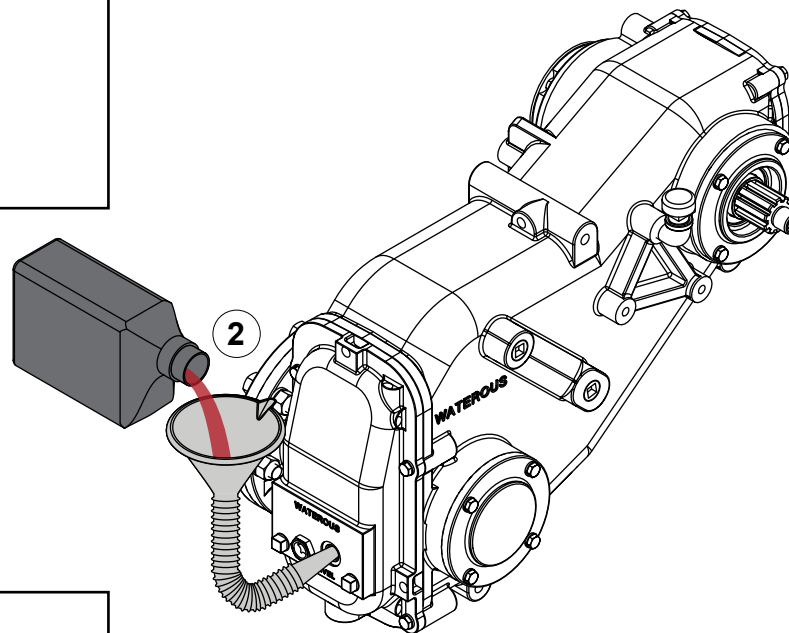
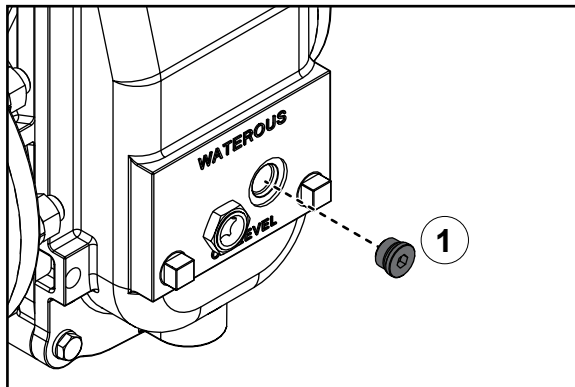
- 2 Add fluid to the transmission case.

**Note:** After pouring some fluid into the case, allow it to settle before adding more to avoid over-filling.

- 3 Add fluid to until it reaches the oil level plug.

- 4 Install the oil level plug and the oil fill plug.

## Adding Lubrication—QB Transmission



Use the illustration and instructions to add transmission fluid. Use ATF that meets the requirements of DEXRON III or MERCON V.

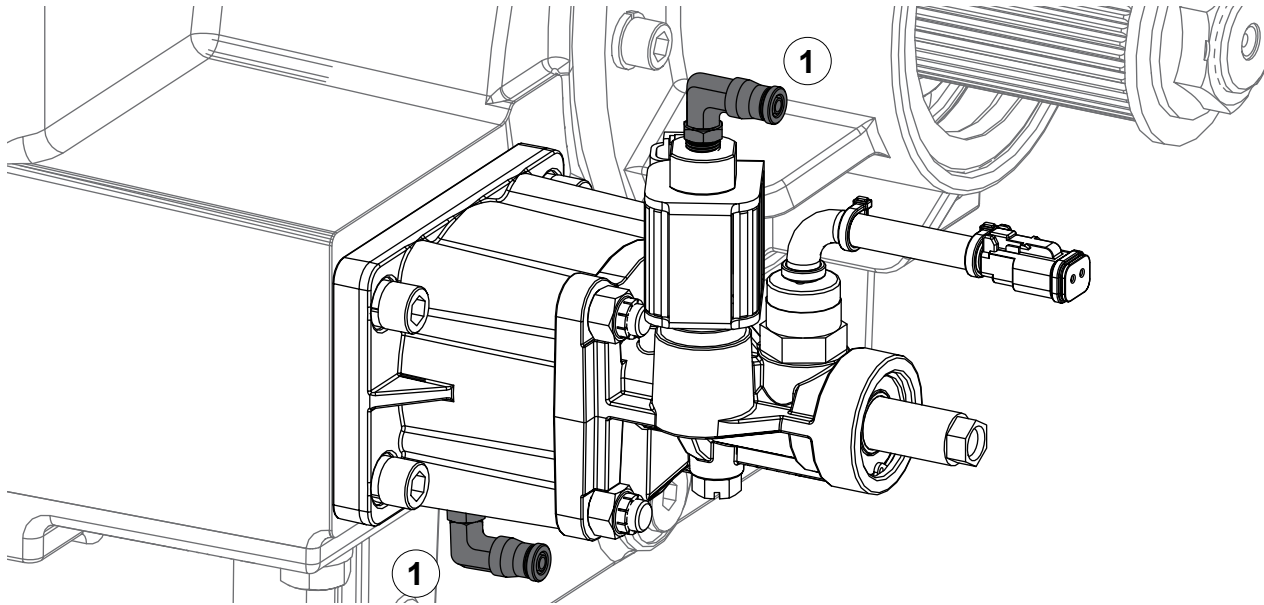
- 1 Remove the oil fill plug.
- 2 Add lubricant until it reaches halfway up the oil level sight plug.

**Note:** After pouring some fluid into the case, allow it to settle before adding more to avoid over-filling.

- 3 Securely install the oil fill plug.

**Note:** Make sure that you do not over-tighten the oil fill plug.

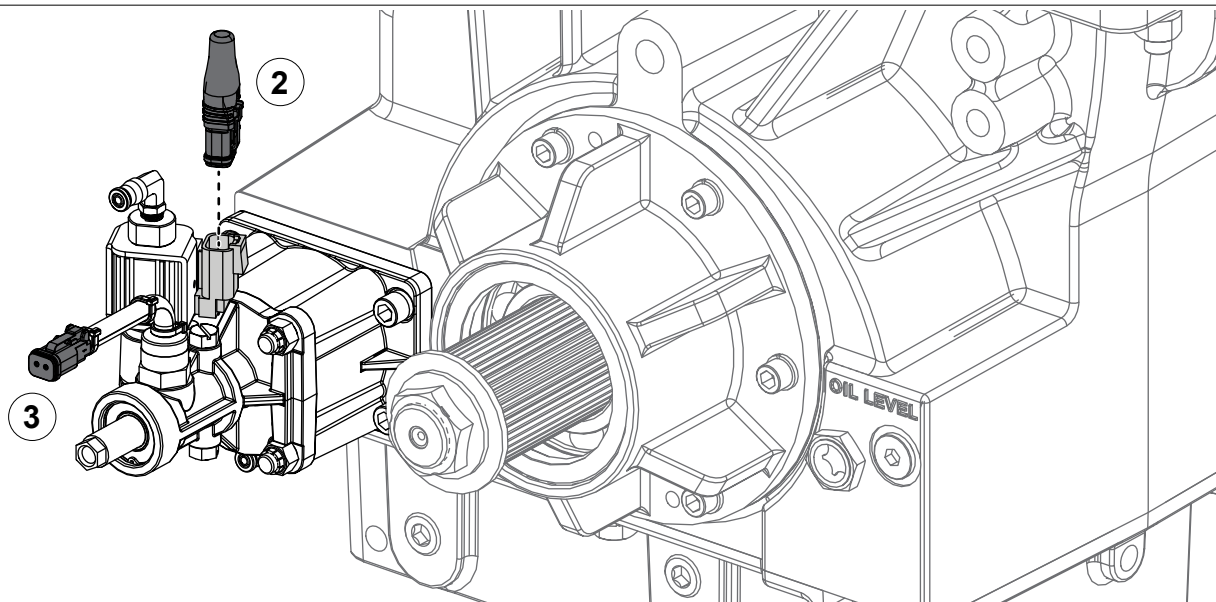
## Connecting the Shift Unit—C22 Transmission



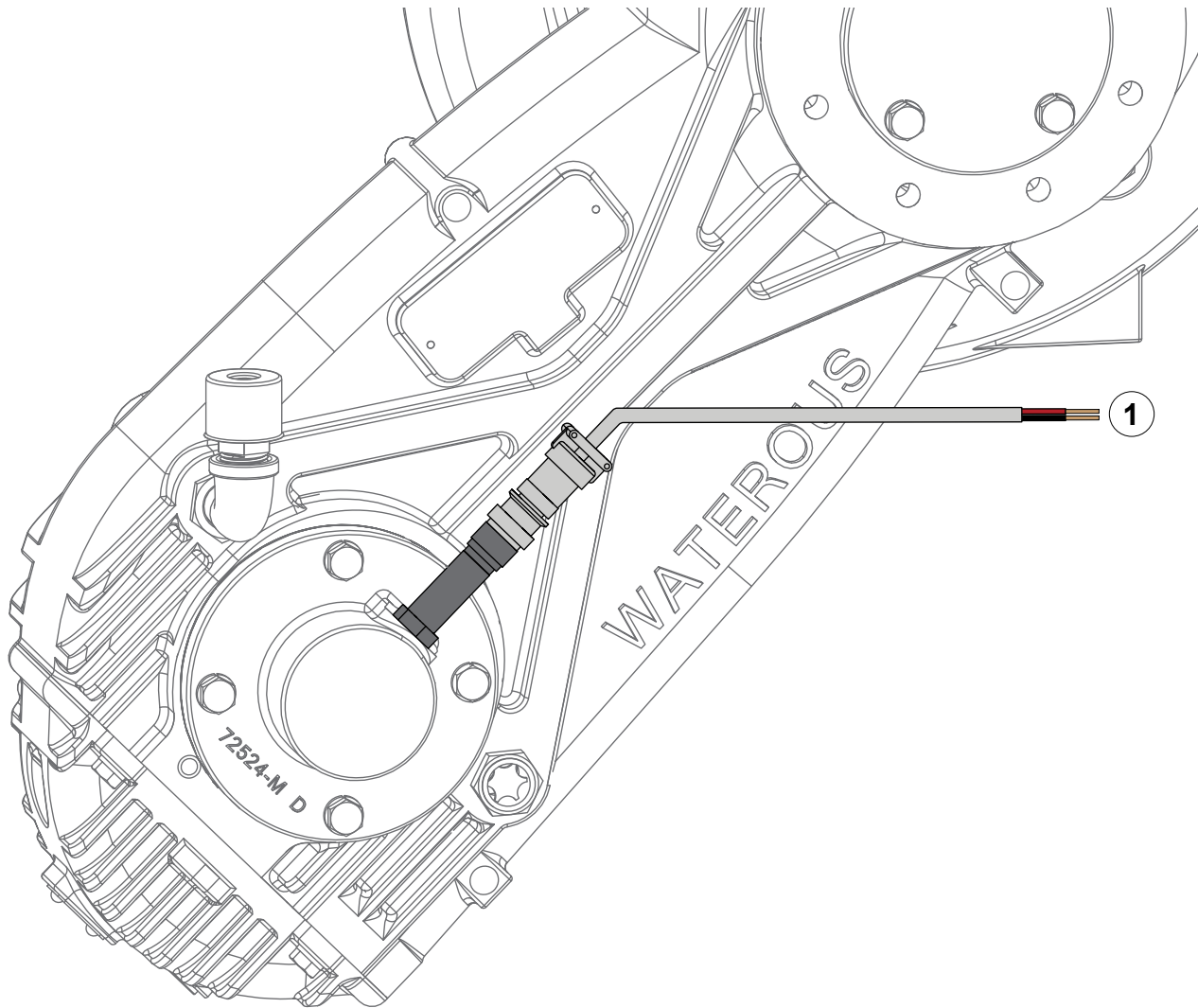
Use the illustrations and instructions to connect the shift unit to the apparatus air supply and shift unit controller.

**Note:** Refer to the *Pneumatic Shift Unit Installation Instructions* for comprehensive installation instructions.

- 1 Connect the air supply tubing from the in-cab pneumatic shift unit to the fittings on the transmission shift unit.
- 2 Connect the safety interlock solenoid to the ECSIS on the apparatus.
- 3 Connect the position switch to the ECSIS on the apparatus.



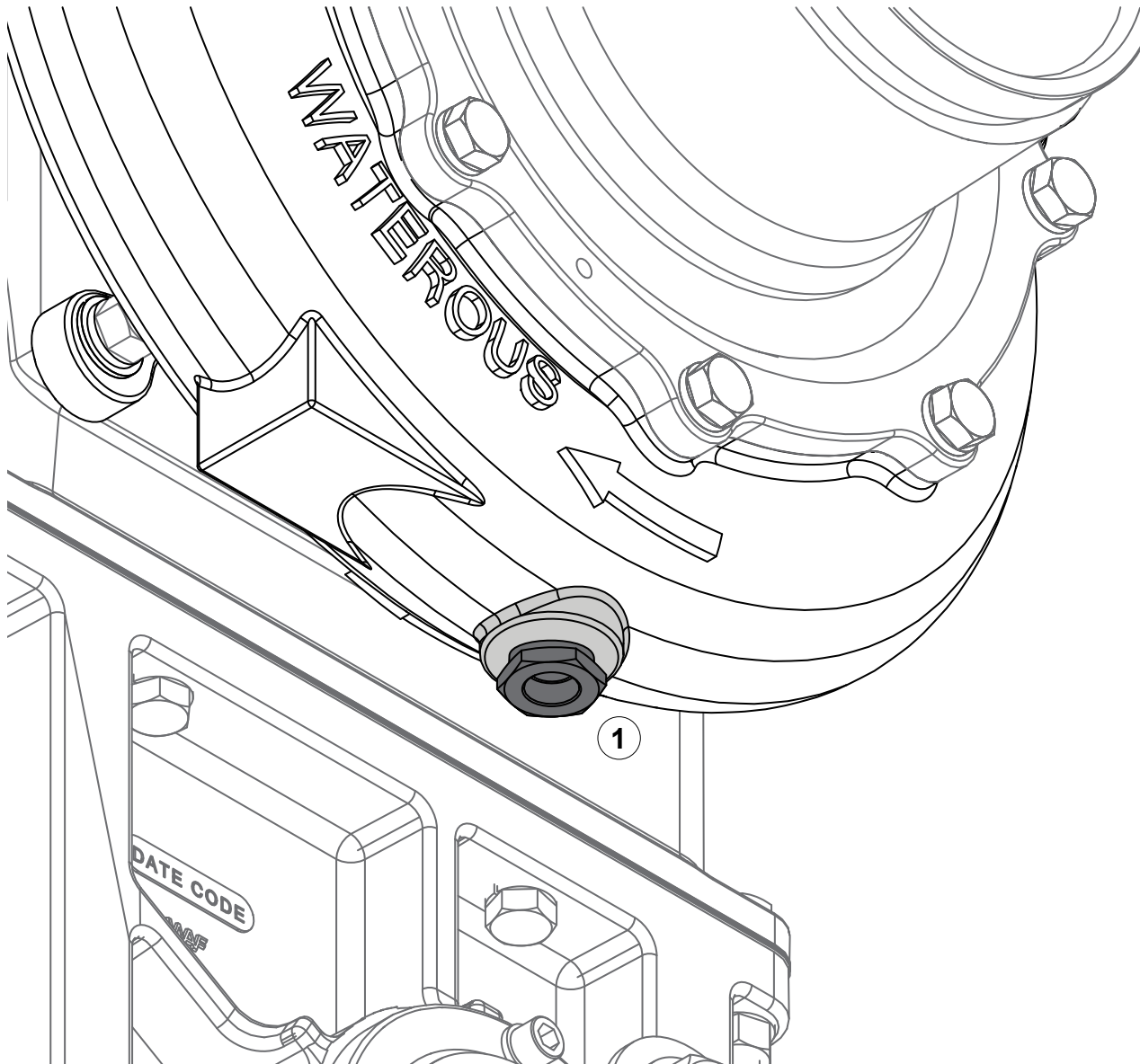
## Connecting the Tachometer—PA Transmission



Use the illustrations and instructions to connect the tachometer cable. The shaft outputs at 6 pulses per revolution.

- 1 Connect the sensor it to the appropriate apparatus electronics.

## Installing the Drain Line—CX Series Pump

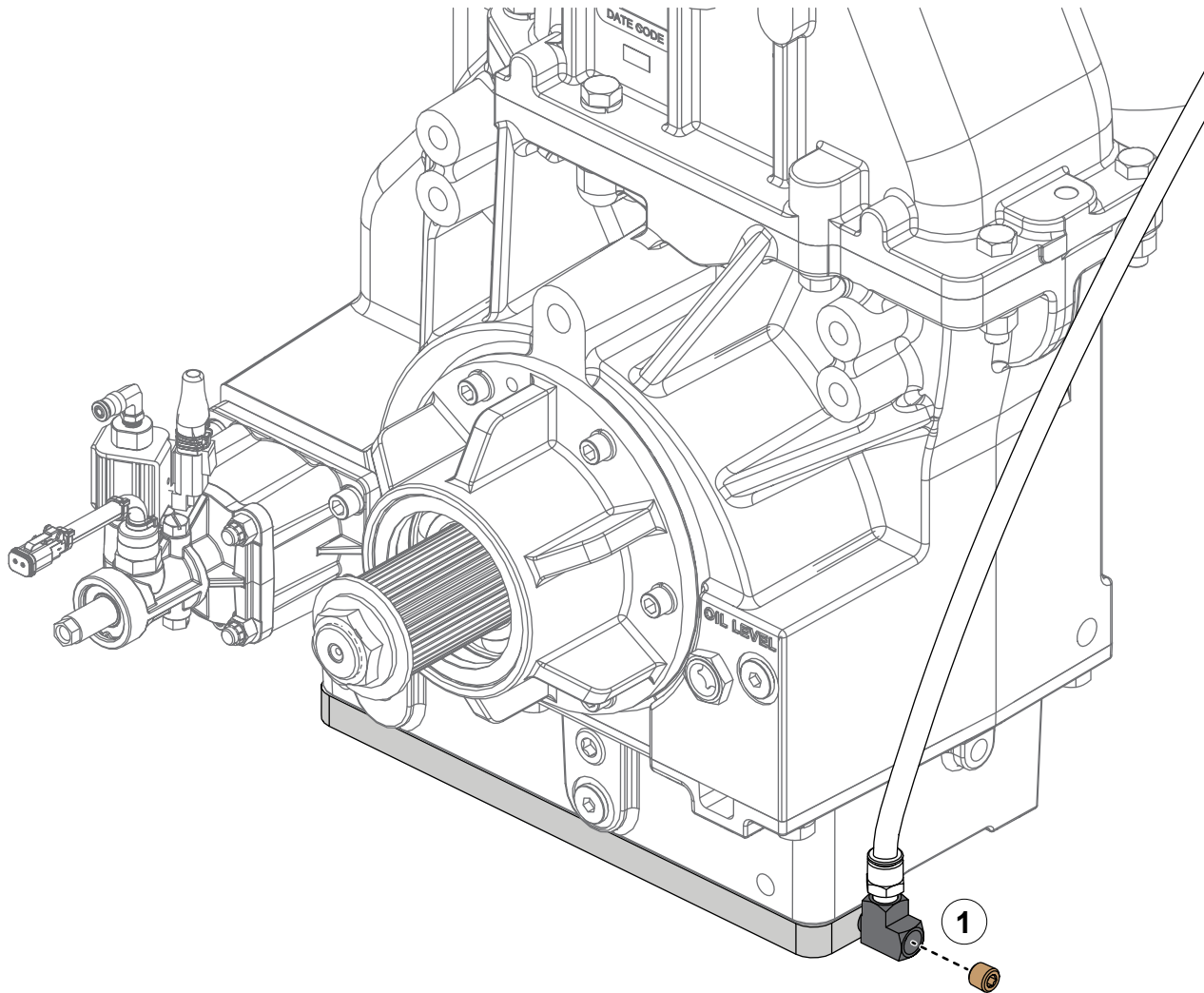


Use the illustration and instructions to install the pump drain lines. Fluid that is susceptible to freezing must be drained from the pump to prevent damage. Additionally, do not store the pump partially full.

- 1 Locally source fittings and hoses to connect to the apparatus drain system.



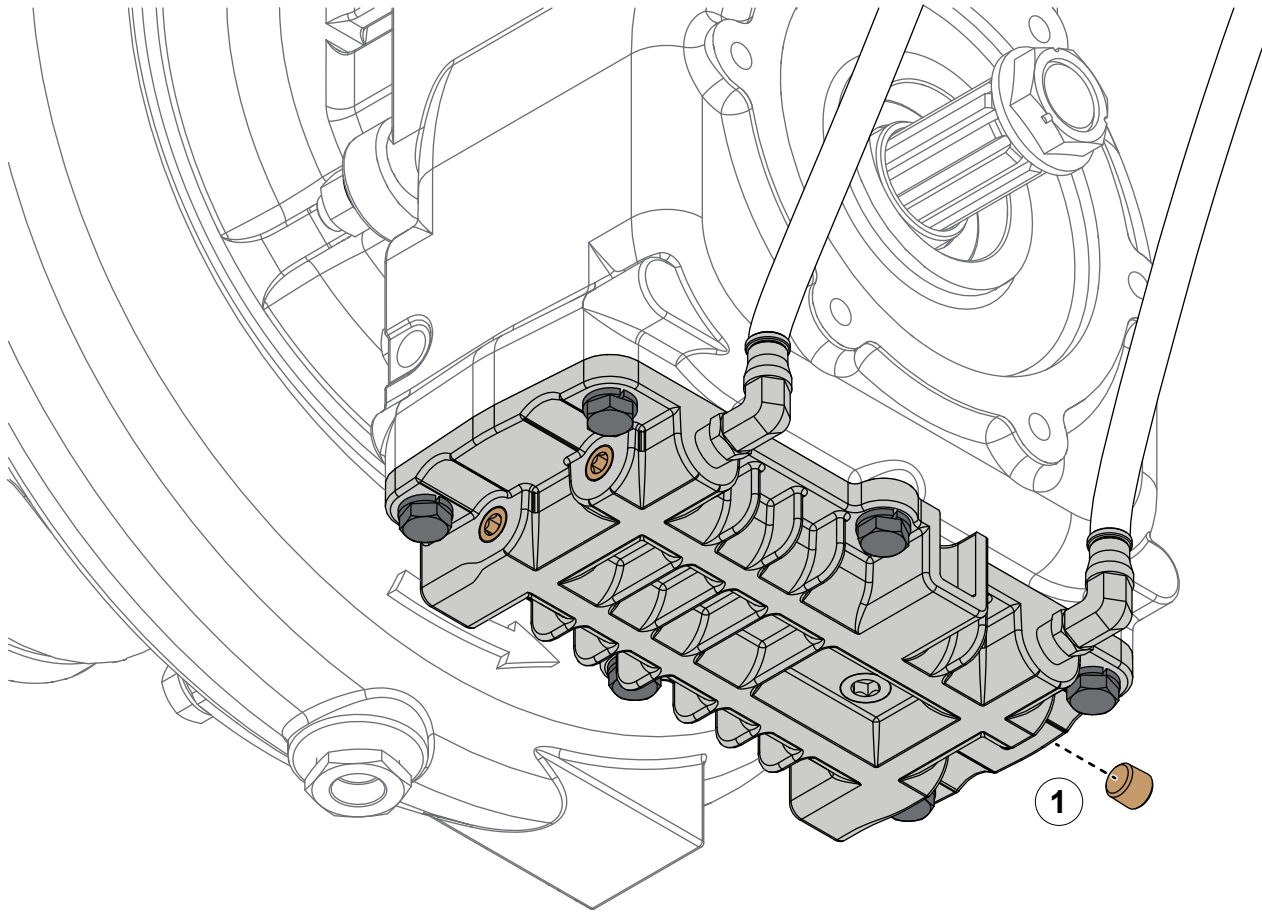
## Installing the Drain Line—C22 Transmission



Use the illustration and instructions to install the pump drain lines. Fluid that is susceptible to freezing must be drained from the pump to prevent damage. Additionally, do not store the pump partially full.

- 1 If equipped, remove the drain plug on the transmission cooler plate and use the appropriate locally sourced fittings and hoses to connect to the apparatus drain system.

## Installing the Drain Line—K and T Transmission



Use the illustration and instructions to install the pump drain lines. Fluid that is susceptible to freezing must be drained from the pump to prevent damage. Additionally, do not store the pump partially full.

- 1 If equipped, locate and remove the appropriate drain plug on the transmission cooler plate and use locally sourced fittings and hoses to connect to the apparatus drain system.

**WATEROUS**

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